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EXTRACT.

Studies in Dog Distemper, IV.*

THE IMMUNISATION OF FERRETS AGAINST DOG DISTEMPER.

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In a previous communication we pointed out that ferrets which had recovered from an attack of dog-distemper were always found to be immune to the subsequent injection of massive doses of distemper virus; further, that ferrets which proved to be immune to one strain of virus were resistant to other strains of the same virus, and that the immunity which resulted from the recovery from disease was of long duration. These conclusions were based on a relatively small number of animals, because spontaneous recovery of a ferret from dog-distemper is unusual, the mortality rate being in the neighbourhood of 90 per cent. Further experience has, however, amply confirmed our original conclusions. This solid immunity in a highly susceptible animal was of considerable theoretical interest and encouraged us to endeavour to immunise ferrets without inducing active disease. We felt that success in this direction would be in the interest of the ferret population throughout the country, and we were of the opinion that a successful technique for the ferret would also prove efficacious, with minor modifications, for the dog.

The following is a summary of our work in this direction and describes what we regard as the best method we have so far tested in some detail. Results in the case of dogs we propose to record at some future date.

As we have been unable to cultivate the virus *in vitro*, in spite of very extensive trials, and have hitherto been unable to secure a clear fluid rich in infective material, we have been compelled to use pulped ferret tissue as our supply of living virus in all experiments. For this purpose we have found ferret spleen, collected late in the disease, the most generally suitable. In our experience the spleen of a ferret which is taken on or about the fifth day of the illness is always highly infective for normal animals, and 0.00001 grm. injected subcutaneously will usually induce a fatal illness in a normal animal.

Our earliest successes in immunising ferrets were really accidental, for they were the outcome of experiments designed to test the keeping qualities of different batches of virus maintained under varying conditions. In illustration of this class of experiment we may quote the following. In July, 1925, a ferret was killed with chloroform on the third day of illness following an acute distemper attack. The spleen was removed aseptically and cut up into small pieces with sterile instruments. Some of the pieces were placed in a vacuum desiccator and dried over strong sulphuric acid; others were immersed in 50 per cent. glycerol and stored in the cold room (Temp. ± 5°C.) At the end of the first and second weeks of storage portions of spleen were removed, ground up with saline, and injected into healthy ferrets. In every instance acute distemper resulted after the usual incubation period. At the end of three weeks the two batches of material were tested once more, and it was found that neither the material stored in glycerol nor the dried tissue proved to be infective for healthy ferrets. On testing the recipients of the inoculum fourteen days later with fresh virus both animals were found to be completely immune. After four weeks the dried and the glycerol-stored spleen fragments were tested again. They proved to be non-infective and later it was shown that the injected animals were not immunised. These experiments, together with many others, show that virus undergoes some form of deterioration when stored, and that there may be a stage in the deterioration at which the virus is no longer capable of causing disease and yet is capable of inducing immunity when injected, in large doses, into susceptible animals. This stage is followed in turn by one in which the virus has become quite inert, neither causing disease nor inducing immunity when injected into ferrets. We presume that the virus at this stage is dead and disintegrated.

Virus inactivated by heat, by carbolic acid, or by formaldehyde does, in suitable dosage, form an efficient vaccine.

Shortly after we had experienced our success with phenol we discovered that distemper virus could be easily killed with formaldehyde and that virus so treated made an efficient vaccine for ferrets. Since the beginning of 1926 we have used this method of making vaccine to the exclusion of all others. Our choice of formalised virus does not rest on a careful comparison of the merits of this product as compared with heated or carbolised material, but rather on general grounds.

Results with Formalised Vaccines.—Our experiments with this type of vaccine now number over one hundred, and successful protection has been secured by means of it in approximately 74 per cent. of cases even though all failures, from whatever cause, are included. These figures alone are sufficiently striking to convince us of the value of the vaccine, but the method is really better than these figures indicate, because an explanation for some of the failures has been discovered.

From our experience we are convinced that the antigenic potency of the vaccine is dependent on the virus content of the material from which it is made. We have found that spleens which are rich in virus give good vaccine, and those which are poor in virus yield an inferior product. It is for this reason that we recommend spleens collected late in the disease, as we find that the virus content is greater in the later stages.

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Closely bound up with this question of virus content is the dose of the resultant vaccine required to confer protection. We can only record that with a good vaccine a dose corresponding to about 0·1 grm. of highly virulent spleen should protect a normal ferret, and a dose of four or five times this amount should be ample in every case. We have occasionally found that the smaller dose will so far protect a ferret that it ultimately recovers, though it suffers a mild disease, while the larger dose results in complete immunity and no illness follows the administration of living virus.

As a routine we have adopted 2·0 c.c. as the standard dose of the vaccine, and, as the initial suspension of ferret spleen is approximately 20 per cent., this corresponds to a dose of 0·4 grm. of material. Unless this dose protects a ferret completely from the living virus we regard the vaccine as inferior.

With a view to determining the degree of success that might be expected in veterinary practice we tested out the method on three, separate, small batches of purchased animals. The ferrets were taken just as they were received from the open market and were not selected in any way. This procedure does not give the best possible result, but would seem to show more fairly what might be expected in the general ferret population throughout the country. For each batch of ferrets a separate specimen of vaccine was employed, which also was not specially selected, though care was taken to use each specimen when it was comparatively fresh and to be sure that the vaccine was made from potent virus.

The net result of these experiments shows that 26 ferrets out of 30 came through the immunisation process with complete success (84 per cent.). This result is reached after all deaths have been placed against the method, but, as we have pointed out, two deaths were directly attributable to sepsis, and these animals should be excluded. If this is done, 26 animals out of 28 survived the infections of at least 100 infective doses of virus after vaccination; and this without developing any symptoms of distemper (90 per cent.). The mortality rate for dog-distemper in the ferret is over 90 per cent., and we see that this can be reduced by a single injection of vaccine to 10 per cent.; and there are good grounds for believing that this figure would be smaller still in the case of a strong and vigorous stock of animals.

The Interval Required between Vaccination and Infection.—In all experiments referred to above there was a time interval of fourteen days between the administration of the vaccine and the dose of the living virus. It appeared to us to be of interest to see if this comparatively long time interval was necessary.

We are forced to the conclusion that a time interval of ten to fourteen days between injection of vaccine and infection is required if reasonably good results are to be obtained in immunisation; and there is no hope of vaccination in the incubation period of the disease.

Duration of Immunity.—The immunity established in the ferret, as a result of the injection of vaccine followed by living virus fourteen days later, is of long duration. A ferret which was immunised over a year ago was tested after six months with a massive dose of virus and found to be immune. It was then kept for a further period of eight months and tested again and found to be immune.

It was felt to be impracticable to keep all the immune animals in order to find out how long the immunity lasted, and small groups have been placed with different interested land-owners here and there throughout the country who have promised to report on the after history of the animals. In this way it is hoped to secure information as to the duration of the immunity and also whether the immunity to one strain really means immunity to all. We have not, up to date, received many reports regarding these animals, but such as we have to hand confirm our impressions regarding the solidity of the immunity.

The Central Nervous System in Immunity.—Two of our immune animals ultimately died with nerve symptoms; one of these has already been recorded by us in a previous publication, and we have not been able to determine with certainty whether these should be regarded as examples of distemper infection of the nervous system in an otherwise immune animal, or whether the nervous disorder was due to some other infective agent. Microscopic examination of the brains did not show a picture typical of distemper, and we failed to pass on the infection to clean animals; but it is recognised that late nerve symptoms may develop in dogs which have suffered an acute distemper attack, and these are usually regarded as distemper manifestations. In the few examples we have met with in dogs we have failed to prove the presence of distemper virus by direct experiment, and we consider it an open question whether these nerve symptoms are really due to distemper or some other infection. These cases of late nerve symptoms, coupled with the sudden appearance of acute nerve symptoms in ferrets which appear to be recovering from the disease after only four or five days' illness, suggested to us that the central nervous system might be susceptible at a time when the rest of the body had a fair degree of immunity.

Three experiments involving six immune animals and three controls were performed to test this point.

We conclude that the central nervous system usually partakes in the general immunity, and that it is the more probable that the late nerve manifestations are due to some other infective agent than dog-distemper.

From all our experimental experience we feel justified in concluding that we are able to immunise approximately 90 per cent. of any given batch of healthy ferrets at will, and that the immunity so established is solid, of considerable duration, and may possibly last for life.

The Keeping Qualities of Formalised Vaccine.—In the case of some of our first batches we believed that we noticed signs of deterioration at the end of a month, while other samples appeared to be quite efficient at the end of two months. After four months' storage, however, these seemed to be useless. We considered that this deterioration might be due to a slow action of the formalin and, as previously stated, we have now adopted the method of making the final product faintly alkaline with ammonia in order to convert all the free formaldehyde into urotropine.

We conclude that the vaccine does deteriorate somewhat on storage, as batches which protect completely when freshly made give an inferior result after the lapse of months;

though the recipient of old vaccine is protected from the worst results of distemper, some symptoms of disease are commonly observed after the administration of virus.

The results do not show a decided difference in favour of the vaccine treated with ammonia as compared with the ordinary product. We are using, and intend to continue to use, the ammoniated vaccine as a routine because the addition of ammonia robs the final product of its local irritant properties and does not appear to have any detrimental action.

Possible Variety of Strain in Dog-distemper.—We have found in every case that a ferret or dog which once had received an injection of one strain of living virus and recovered, was immune, for a time at any rate, to all other strains we gave subsequently ; and from these observations we have stated in publications and reports that there was no evidence of more than one strain of dog-distemper. There are, however, certain facts in connection with immunisation of ferrets which do not harmonise with this view and the precise explanation of these is obscure.

It appears that to confer solid immunity against several strains of distemper in the case of the ferret, living virus must be administered. This can be done with safety if before the living virus is administered vaccine made from that strain is given. It is not safe to vaccinate with one strain and attempt to consolidate the immunity with another. Why this should be the case we do not know, but it may mean that there is some minor difference between the various strains of dog-distemper ; a difference which will show in a vaccinated animal, but which is swamped in the more solid immunity which arises as a result of recovery from injection of living virus.

The Nature of the Immunity.—Quite early in our investigations we made experiments to ascertain whether the serum from immune animals contained antibodies in sufficient amount to be of use in the prevention of the onset of disease. It was felt that if an anti-serum could be secured it should be possible to devise a method of protection along lines similar to those which are so successful in the case of rinderpest. The results of our tests were disappointing, for they indicated that the immunity to dog-distemper is cellular and not humoral.

Recovered Animals as Carriers of Disease.—We considered that it was probable, on general grounds, that carriers would be found among the ferrets which had recovered from attacks of dog-distemper ; but in our laboratory experience we have not so far encountered any examples. Recovered animals have been mixed with susceptibles on several occasions, and no disease has developed. We were thus inclined to believe that carriers, if they existed, were infrequent. Data which we now possess, however, show that carriers may be of considerable importance. The data concern a small ferret-breeding establishment run by Capt. W. B. Higgins, and it is due to his keenness and care in the maintenance of complete and precise records that we are convinced as to the importance of carriers.

Under laboratory conditions we have thus uniformly failed to prove the existence of carriers, but Capt. Higgins' observations are so good and his records and reports so full and accurate that we consider it proved that a recovered animal may carry infection for a time. A. R. S.

Note on the Voronoff Operation—Technique for the Implantation of Testicular Grafts.*

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[Note. The author's account of this operation, reprinted as an Appendix to the Report of the Ministry of Agriculture's Representatives on the Delegation to Algeria, was reproduced in the *Record* of April 21st last (p. 319), but we publish this fuller account as it will be of more use to members wishing to consult a description of the procedure adopted.—Ed.].

I have recently had an opportunity of witnessing Dr. Serge Voronoff perform the operation of gonad implantation which has come to be associated with his name. This operation has gained a certain measure of notoriety during recent years, mainly as the result of those spectacular and dramatic claims which have been made concerning the success of its application for the "rejuvenation" of the aged and decrepit human male. It should be clearly stated at the outset that Voronoff himself has not been responsible for most of these exaggerated assertions: they are the result of journalistic exuberance arising in individuals whose respect for scientific truth is as inconspicuous as their scientific knowledge. At the same time, pending further investigation, it is desirable to preserve an open mind concerning the utility or otherwise of the Voronoff operation, for undoubtedly evidence which demands careful consideration has been adduced, and theories which call for substantiation and amplification have been enunciated.

Briefly, Dr. Voronoff and his co-workers claim primarily that by the implantation of a graft from the gonad of a healthy young male adult into an aged sire (human or otherwise) certain benefits are conferred. There is an arrest of the processes of senile decay, and a revivification of general bodily metabolism, together with a recrudescence of sexual desire and spermatogenesis. The second claim which is made specifically for sheep is that the immature male, not yet arrived at puberty will, subsequent to the engrafting of a portion of mature testis, attain maturity earlier, will reach ultimately to a greater body stature, and will yield a higher wool clip than similar normal controls kept under identical conditions. Further, such animals, it is claimed, possess the power of transmitting certain of these enhanced characteristics to their progeny of the first generation—both male and female. (Dr. Serge Voronoff : "The Study of Old Age and my Method of Rejuvenation," 1926 ; also *Comptes Réndus, Séances de l'Acad. des Sciences.* T. 185, p. 480, 22nd Aug., 1927.).

Before these claims can be accepted scientifically further critical evidence must be accumulated (and is being accumulated here in Edinburgh and at Cambridge) ; while should the experimental evidence prove encouraging, it would thereafter be necessary to submit numbers of animals to confirmatory trial under field conditions (in order to extend the necessarily restricted experimental work) before the method could be at all widely utilised for the improvement of animals of agricultural importance.

* Presented to the Scottish Metropolitan Division at Edinburgh, on 25th April, 1928.

The purpose of this account is to furnish an accurate description of the operative technique employed by Voronoff, for the reference of any who may wish to make use of it. Certain details of restraint and anæsthesia are not those used by Voronoff, but they are given because operative experience with British breeds of sheep has shown that they are not likely to tolerate methods of control and restraint which the less improved foreign breeds apparently withstand successfully.

Application of the Voronoff Operation to Animals.

The operation for "rejuvenation" of the aged male does not in any technical detail differ from that applied for the stimulation of the immature individual prior to puberty. Animals upon which the operation for "rejuvenation" might be performed are those aged sires of any species which by progeny test have proved pre-eminent in begetting young of supreme quality in one or another respect; for instance, the stallion with offspring exhibiting track or other records of a high standard of excellence; the bull whose daughters have proved pre-eminent in the production of milk of good quantity or quality, or whose steers have shown remarkable capacity for fattening and early maturity; or a ram, boar or male dog in the offspring of which there appears some hereditary characteristic which it may be desirable to encourage, expand, or even perpetuate.

The stimulation of the immature male to early maturity, greater body size and increased production of meat or wool, and the transmission of these qualities to the offspring, would seem to have an equally wide practical application to different species of animals, but it is difficult to forecast for it any application to man with the possible exception of certain cases of prepuberal arrested bodily or mental development depending upon insufficiency of testicular hormone.

Both the operation for "rejuvenation" and that for stimulation of the immature have been applied by Voronoff to animals, in the former case as a background for his operative procedures in the aged human male, and in the latter case extensively to sheep in Southern Algeria, where, with others delegated from Britain, I had the opportunity of seeing him perform the operation, and of examining his experimental material. It is this operation on sheep which is subsequently described, but apart from the necessary differences regarding the origin of the testicular material, control, etc., where other animals are used, the details, as has already been mentioned, do not differ.

Material required.

For each animal to be grafted a donor of testicular material is required. In instances where two or more animals are to receive grafts upon the same occasion, one donor may supply sufficient testicular material for two or more recipients. In certain special cases it may be possible to obtain testes from a local abattoir or knackery, but obviously they must be secured immediately after the death of the animal, removed under scrupulously aseptic precautions and transported in a sterile vacuum flask, containing a solution of physiologically normal sodium chloride or Ringer's solution, kept at body heat, or they may be conserved for even longer periods in an ice-box.

(1) *Age.* It is important that the donor of testicular material shall be healthy, vigorous, and preferably of an age when the testicle is ordinarily very active, *e.g.*,

Ram, 1½—2½ years.
Bull, 3—4 years.
Stallion, 4—5 years.
Boar, 2—3 years.
Dog, 1½—3 years.

These ages apply not only to the donor of grafts for "rejuvenation" in each species, but also to donors of material to be used for purposes of stimulation. (It should be noted that for the stimulation of early maturity in animals other than sheep, actual figures are not yet available; the ages given are those when the sexual life of the individual is reaching its prime—as judged from ordinary breeding practices.)

(2) *Time of Year.* The time of the year when grafting of sheep should take place in Great Britain varies according to the breed. In the case of the Lowland breeds, in which lambing commences in December and January (such as the Suffolk), the ram lambs would need to be operated on in April and May (*i.e.*, when they are four to six months old). Those breeds lambing in February and March would be grafted in June and July, while in the Northern Mountain breeds lambing in April and May, the ram lambs would require to be operated on in August and September.

Under these conditions, service of a limited number of ewes would be possible by the ram lambs when of the age of seven to eight months. Otherwise, where such early use of the rams is not thought to be desirable, they should be operated on when about eight or nine months old and used for breeding when 19 months old—which is the more rational practice.

In any case, a minimum of two months should be allowed between the time of grafting and the use of the ram for service, and if possible *not more than* nine or ten months should elapse between the time of grafting and service.

Preliminary preparation.

For 24 hours before operation the animals should be shut indoors and fasted. This is essential to avoid danger from asphyxia through tympany of the rumen causing pressure on the diaphragm and thoracic contents. In the dorsal position eructation of gas from the rumen is impossible, and it is accordingly unsafe thus to secure a heavy sheep with a replete alimentary canal.

Instruments.

The following list of instruments is rather more extensive than is absolutely essential, but it is calculated to facilitate and expedite operation:—

One emasculator (Haussman and Dunn); 4 scalpels (medium); 1 scalpel (large); 2 pairs dissecting forceps; 2 pairs Mayo's tissue scissors; 2 pairs vulsellum forceps; 20 pairs artery forceps; 4 Reverdin needles to take No. 000 and No. 00 catgut; 4 tubes No. 000 catgut (chromicised); 4 tubes No. 00 catgut (chromicised); 1 blunt dissector (Koch's); 1 dozen small towel clips.

Materials, Dressing, etc.

Two "windowed" Holland cloths, 2ft. by 2ft.

One sterile container (fish-kettle or saucepan) to hold the two testes after removal from the castrate. This should contain about a pint of N/P saline or Ringer's

solution, and two sterile napkins to wrap round the organs, or large gauze compresses.

A supply of sterile gauze swabs, cotton wool, etc.

Tincture of iodine, spirit 90 per cent., collodion flexile, barium sulphide, novocaine solution 2 per cent.

Administration of Hypnotic. (See later under Anæsthetic).

Restraint.

The two rams—the juvenile recipient, and the mature donor—are secured upon tables supported by trestles, and fixed in the dorsal position. The four limbs and the head are tied by rope hobbles to conveniently situated staples in the table. (In the case of horned breeds the head is tied by them to the table; with polled breeds, a strong halter or head-collar may be used to attach the rope to the head.)

When the sheep have been secured, the head end of each table should be raised at least 1 foot higher than the tail end, and propped so by blocks or some other convenient means. This throws the bulk of the abdominal organs backwards and thereby relieves the diaphragm and thoracic contents from undue pressure, thus avoiding pulmonary congestion, dyspnœa, etc. (The importance of this has been mentioned, but I should like to emphasise it still more.) The tables should be arranged side by side contiguously, and with the light falling from behind the operator.

Preparation for Operation.

The long wool on the scrotum is removed with scissors, and thereafter the whole of the scrotal skin may be shaved or covered with a paste of the consistency of cream, made by rubbing powdered barium sulphide in warm water. This should be spread on with a spatula since it is liable to excoriate the skin of the hand if it comes into frequent contact with it. The paste is allowed to act for from five to ten minutes, according to the density of the wool which varies in different breeds, and is then washed off very thoroughly with soap and warm water. The removal of the paste must be thorough and must take place as soon as the action on the wool ceases. If allowed to act for too long a time the epidermis will become dissolved, and a superficial inflammation will result. The donor of the grafts is dealt with first, and the recipient immediately afterwards.

After the scrotum has been prepared in this way and the seat of operation has been lightly dried with cotton wool or gauze, it is painted all over with 2½ per cent. tincture of iodine and sterile Holland cloths (in the centre of each of which a sewn window about 4 inches long has been prepared) are arranged over the neck of the scrotum of each animal, and fixed there by tissue clips.

A second swabbing with tincture of iodine is carried out and the animals are ready for operation.

Anæsthetic.

No general anæsthetic has yet been found to be entirely safe for administration to the sheep. Chloroform is quite unsuitable; chloroform and ether ("C.E.") mixture is less undesirable, but is followed by a percentage of deaths too high to permit of its recommendation for other than short periods of general anæsthesia, while the same remark applies to A.C.E. mixture.

The best results seem to follow the administration of from 4-8 drms. each of potassium bromide and chloral hydrate dissolved in a half pint of treacle water and given by the mouth 1½ hours before operation. These doses are for an adult sheep of average size; they must be adjusted for those of small or large size. It is possible that after further trial sulphonal or luminal soda (by injection) may be found to give better results, although theoretically all drugs of the barbitonum group are unsatisfactory for administration to herbivore.

Locally, novocaine has been used with satisfactory results by Dr. Vornoff and his colleagues in France and Algeria, and in my work here in Edinburgh. About 10 ccs. of a 2 per cent. solution are used to infiltrate the skin over the site of incision on each side of each animal's scrotum. (This procedure, contrary to expectation, does not appear to prejudice the chances of survival of the graft.)

The Operation.

The principles of the technique upon which most stress is laid are:—

(1) Transplantation of the grafts to the place in the body which Nature intended them to occupy.

(2) Irritation of the implantation surface by scarification in order to provoke a local congestion which will hasten the formation and growth of new capillary loops destined for the nutrition of the graft.

(3) Preparation of the grafts in thin slices to facilitate perfusion of all the cells by serum (extravasated from the injured surfaces), so that they may be enabled to survive by imbibition during such time as the new capillary loops are forming.

(4) Implantation of two grafts on to each testis in such a manner that in each organ the grafts are on opposite faces of the organ as distant from each other as possible.

Steps of the Operation.

The two sheep are arranged on their respective tables side by side, and the sterile receptacle to preserve the organs from the effects of cold, dust, etc., is placed conveniently nearby.

(a) *Castration.* The donor is castrated by the covered operation so that each testis is removed enveloped in its tunica vaginalis. The emasculator is used to sever the spermatic cord and check hæmorrhage, and the testes are immediately transferred to the sterile container. (If more than one animal is to be grafted on the same occasion it may be advisable to leave one testis in position until the second animal is ready to receive its grafts, since one testis is more than sufficient to supply the four grafts for one animal. The wounds in the scrotum may be sutured with catgut or silkworm gut if so desired. This is always advisable when flies are troublesome.

(b) *Preparation for Implantation.* The skin of the scrotum is incised by a linear incision about 3 inches long made slightly towards the lateral aspect of the anterior face and reaching down to within an inch of the distal tip of the scrotal pouch. It is secured by artery forceps and reflected, being separated by blunt dissection from the tunica dartos and loose sub-dartal scrotal fascia. Hæmostasis is effected by pressure from artery forceps. The tunica dartos is now secured by four pairs of artery forceps and between these an incision is made through it down to the external surface of the parietal layer of the tunica vaginalis, taking care to avoid cutting any of the numerous

thread-like arteries which ramify over the external vaginal surface. By retraction with the artery forceps the testis covered by its tunica vaginalis is fully exposed. Using the handle of a scalpel or a blunt dissector, two pouches are now made—one to the right and one to the left of the incision, between the tunica dartos above and the tunica vaginalis below (*i.e.*, into the peri-vaginal fascia). These pouches facilitate rotation of the testis about its long axis, and also enable the grafts to be accommodated in them.

Rotation of the Testis.

To bring the lateral face of the testis into the operation wound in the scrotum, the testis must be rotated. This is best accomplished by lifting the lower pole up through the wound, securing it with vulsellum forceps in such a way that the enclosed cauda of the epididymis is not injured, and then making a quarter of a turn to right or left. These forceps are used subsequently to anchor the testis in a fixed position—being held by an assistant.

Scarification.

Using one of the handled Reverdin needles, the tunica vaginalis is thoroughly scarified, until its surface and the pari-vaginal fascia are sufficiently injured to cause a number of tiny bleeding points to appear over an area about 1¾ inches long and ½ inch wide on the lateral face of the testis (*i.e.*, the area upon which the first implantation is to be made).

Upon the thoroughness of the scarification of this outer surface of the vaginal tunic depends the chances of survival of the graft. The local aseptic inflammation and congestion so secured facilitate the growth of capillary loops into the superimposed graft, and the exudation of serum which follows the local injury enables the graft to live by imbibition until such time as vascularisation of its substance can be established.

Preparation of the Graft.

During this time the testis has been lying wrapped in its warm moist napkin, under conditions calculated to keep it as nearly living as possible. It is taken in the left hand and the epididymis cut cleanly from it with scissors; thereafter, freed from its tunica vaginalis which strips off after the epididymis is severed, the testis is bisected through the testiculo-epididymal junction—using the large-bladed scalpel.

From the anterior edge (*i.e.*, opposite the testiculo-epididymal junction) of one half of the organ, a strip of albugineous coat and gland substance about 1½ inches long and slightly less than ½ inch wide is cut with a pair of scissors in such a way that from ¼ inch to ⅜ inch thickness of gland tissue is included. It is better to cut so as to include considerably more than this thickness in the first instance, and subsequently to trim it down so that there remains a flat glandular surface, which must not be greater than the scarified area on the tunica vaginalis against which it is to lie. It is important to ensure that the graft so prepared is free from all ragged portions, and cut with straight level edges as neatly as possible. Ragged portions, owing to their movement, are not likely to be easily vascularised. Without loss of time the graft should be secured in position.

Fixation of the Graft.

The scarified area is wiped free from blood clots, coagulated serum, etc., and is given a few final scratches, and the graft is laid upon it at once. Four sutures of No. 000 catgut, most conveniently inserted by means of Reverdin needles, are used to secure it in position—one at each end, and one about half-way along each side. An extra one or two sutures may be necessary if the graft does not lie perfectly flatly upon the scarified area. In inserting these sutures care should be taken to avoid including in them any of the numerous small vessels that ramify through the peri-vaginal fascia, and over the surface of the tunica vaginalis. To tie these sutures carelessly including vessels within their loops is likely to compromise the integrity of the graft through what is virtually ligation of a section of its vascular field.

Subsequently, the testis is rotated in an opposite direction, to bring the medial face into the scrotal incision. A scarified area and a graft similar in all respects to those of the lateral face of the organ are prepared, and the second graft is fixed to the testis using the same technique as for the first.

Closure of the Wounds.

The testis is then released from the anchoring vulsellum forceps and arranged *in situ* within its coverings. The artery forceps used for retraction of the dartos are now approximated, and the incision in this structure is closed by a continuous blanket suture of fine catgut. The skin edges of the scrotal wound are then closed, using a heavier variety of catgut (or silkworm gut if preferred), employing the ordinary interrupted method with about ⅜ inch spacing. A light swabbing with rectified spirit dries the edges of the incision and fixes surface cells; and subsequently the wound is sealed with collodion and a thin layer of cotton wool or with flexible antiseptic wound varnish.

The second testis is treated in exactly the same manner, receiving two grafts on opposite sides, and finally the sheep is released.

After-treatment.

Wounds should cicatrise in from 10—14 days, during which time the animal should be kept under supervision in a dry clean pen for preference. Beyond the removal of the sutures (in ten days) when silkworm gut has been used, no further operative interference is required.

Untoward Sequelæ.

(1) *Suppuration*, through infection during operation, is rare if ordinary aseptic principles are observed, and never occurs when scrupulously aseptic conditions obtain. The tissues of the sheep possess very considerable powers of resistance against ordinary bacterial invasion and surgically inflicted wounds heal rapidly by "first intention." When suppuration does occur a simple subcutaneous abscess results, which, however, in no way injures the testis, though it may destroy one or both grafts. In such cases re-grafting may be performed subsequently.

(2) *Necrosis of the Grafts* may occur under the following conditions:—

(a) when the graft has been too large or too thick to allow of rapid vascularisation;

(b) when the area of implantation has been insufficiently scarified;

(c) when blood and serum have been allowed to coagulate over the implantation surface through undue delay in the fixation of the grafts. To avoid this contingency the surface should be freshly

scarified immediately before apposition of the graft takes place, any coagulated blood or serum being previously removed by swabbing;

(d) when the grafts touch each other or are in too close proximity. It is to avoid this that they are placed on opposite sides of the testes.

(3) *Liquefaction and Absorption* may follow an attempt to implant grafts which are too small or too thin. When inadequate in this respect, the expected stimuli may be indefinite or wanting through insufficiency of material introduced, yet the grafts can be palpated without difficulty. In other cases, after the lapse of some weeks palpation fails to reveal the graft, and it may be assumed that complete liquefaction and absorption have occurred. Where failures such as these result the operation may be repeated in 3-4 months.

This concludes the account of the technique of the operation.

Example of the Rejuvenation of a Bull.

I should like to read you an account of the Rejuvenation of an aged bull given by Dr. Voronoff as typical of the results he has obtained in other animals. The following is a careful translation of the account given in *The Study of Old Age and my Method of Rejuvenation*, by Serge Voronoff, 1926, pp. 60 *et seq.*

" During my stay in Algeria, where I went in order to apply my method of grafting to sheep belonging to the Société Agricole Algérienne and to the General Government of Algeria, M. Georges Nouvion, the director of the above mentioned Society, requested me to rejuvenate an old bull. Beautiful stud bulls are constantly brought over at great expense from France in order to improve the native bovine race which is relatively much weaker and smaller. These bulls terminate their career when 10-12 years old, when they have to be replaced at great cost to the breeders. To prolong the period during which those stud animals are capable of fecundating is an economic problem of great importance. For this reason the Société Agricole Algérienne requested me to attempt the experiment on one of their old bulls, Jacky, who was 17 years old and who had been quite useless for stud work for two years. I accepted this offer and went to the Bou Chellel farm, near Blidà, where I was able to see for myself that Jacky was indeed in a lamentable state. Very thin, with dull eyes hardly showing in a head stamped by the characteristics of old age, with lustreless hair, Jacky kept away from the main flock and took no interest in his female companions. His place had been taken at their side by a young rival whom Jacky avoided for good reasons. The young bull attacked Jacky whenever the latter approached with the best and most peaceful intentions, and Jacky had to fly as he was incapable of putting up the slightest resistance against his adversary.

" On March 5th, 1924, I grafted into him the testicles of a native three-year-old bull in front of a great number of breeders interested in my experiments. My two assistants had come with me from Paris. They were Dr. Puelma and Veterinary Surgeon Schmidt. They were accompanied by Dr. Barillon and Veterinary Surgeons Pons, Bosselut, Wagner and Barlette. These gentlemen lent me their most precious aid, as indeed it is no easy matter to operate upon a bull even when it is old, nor is it a matter free from all danger. Although the animal was made to lie upon its side and was kept in this position by some ten Arabs, it gave frequent signs of impatience which resulted in the frequent upsetting of all the surgeons . . . .

" On June 27th, I received a letter from M. Georges Nouvion informing me that the experiment had been completely successful.

" *Extract from letter received from M. Nouvion.* ' The bull we operated upon is keeping very fit; its hair has become glossy, its eyes sparkling, and what is even more interesting the animal now seems full of ardour. During the last few days he was put with a cow that was on heat, and he covered this animal four times during the course of the morning, which number is quite a record. Since then he is able to continue to cover animals brought to him.'

" *Extract from another letter from M. Nouvion, 20th March,* 1925. ' I have told you in a previous letter of the prowess of Jacky whom you grafted about this time last year. At the time of your intervention this animal's reproductive career was completely ended and I was upon the point of selling him to the butchers. About three months after the operation, during May, 1924, he was able to resume his reproductive functions and he has scarcely ever ceased to exercise these save when it has been impossible to furnish him with partners. Among the cows with which he has been coupled soon after the operation, three have recently produced calves. Two of these bear all the characteristics of the race of their sire, and the third is undoubtedly his offspring.

' In order to give you precise details of the way in which he behaves, I quote extracts from the service book kept at the farm :—

Cow.	Date.	No. of Service.
Grisette ...	Jan. 19th, 1925 ...	4
	Feb. 9th, 1925 ...	3
Negresse ...	Jan. 20th, 1925 ...	1
	Feb. 4th, 1925 ...	1
	Feb. 5th, 1925 ...	2
Mandarine	Feb. 20th, 1925 ...	1
Bichette ...	Jan. 24th, 1925 ...	3
Zorah ...	Jan. 26th, 1925 ...	3

' Jacky still remains in the most perfect condition. The eyes are bright and the hair glossy. He has again become very vigorous, so much so that when he is locked up he is able to jump over very high barriers in order to join the herd.'

Dr. Voronoff continues: " I saw this animal again on the 8th April (1925) . . . and I found this bull completely changed and possessor of its pristine vigour and sexual ardour. A year after the operation, not only do the advantages of the graft remain, but they even seem to increase with time . . . . . I do not know whether this bull will live longer than other animals, only the future can tell us, but Jacky has already resisted in a surprising fashion the dearth of water and food that occurred last summer, and it is quite logical to suppose that an animal that has regained such magnificent health and such great strength will live longer than one which shows signs of extreme weakness and which is, therefore, an easy prey to pathogenic organisms."

At the time of the inspection of this bull by the delegates the following additional information was secured.

Jacky's breeding record for 1925 and 1926 is as follows :—

1925 ... ... 6 calves.
1926 ... ... 3 calves.

It was stated that three years after the operation in 1924, Jacky, though still in fair physical condition, began to show once more enfeebled reproductive powers, and it was then decided to perform the Voronoff operation for the second time. This was carried out in April, 1927. (It is of interest to note that the graft implanted in April of this year cannot now be clearly distinguished on palpation of the scrotum).

Three months later Dr. Voronoff received from M. Nouvion this telegram: " Bravo ! Jacky recommence."

Since this second operation, Jacky has served four cows and it as stated that all of these are in calf.

I should like to state specifically that I associate myself entirely with the considered opinion contained in the Report on the Voronoff Operation made by the British delegates to the Ministry of Agriculture; that is, that while it cannot be said that Voronoff has conclusively proved his thesis, a sufficiency of data has been brought forward to make it eminently desirable that further experimentation shall be carried out under critical conditions, in order that his method may be tested scientifically and exhaustively. Work is already proceeding in this and other countries. Perhaps I may be allowed to make an appeal to anyone in a position to do so to assist in this work. Aged sires of any species of farm livestock which have passed their prime and are failing or have failed in their reproductive powers are suitable subjects for the operation, provided a young active sire of the same species can be obtained simultaneously. Previous breeding records are most important; and it is necessary to have opportunity to test the animal's breeding powers subsequent to the operation. The technique is not difficult though scrupulous asepsis is, of course, essential. I should be happy to help anyone in any way possible.

. . . . . .

Mr. Miller then showed some thirty lantern slides made from photographs taken during the visit to Algeria, the majority being of Voronoff's experimental animals and the controls.

The PRESIDENT (Prof. R. G. Linton) said that he had recently been in close touch with certain poultry experiments which were concerned with the stimulation of early maturity, and one result of these experiments was to leave one in doubt as to the desirability of forcing early maturity, since there were indications that forcing of the pullet may, at least in some cases, lead to an early falling off of egg production. He would like to ask Mr. Miller whether he considered that the stimulation of early maturity was always entirely justified.

Mr. MILLER replied that he thought it depended upon the economic conditions under which animals were kept. Where lambs were killed for the markets at the age of four or five months there might be some justification on the breeder's part for aiming at earlier maturity, and in the case of slowly developing types of livestock it was desirable to speed up maturity for earlier consumption, but he did not think that it was at all advisable in the case of breeding stock or in draught animals. In Great Britain there had been much done during the last two decades to speed up maturity of the food animals, and it was probable that the peak was by now nearly attained. He desired to make it clear that Voronoff did not claim to have induced primary early maturity so much as that his operated animals at a given age were bigger and heavier than his controls, although growth apparently ceased at about the same time. Whether heavier and bigger sheep were wanted by the consumers in this country was an entirely different question, although there was no doubt that better quantity and quality in the wool clip were desirable.

The Pathology of Certain Avian Morbid Conditions Compared with that of Analogous Diseases in Mammals.*

By H. P. BAYON, Cambridge.

(ABRIDGED.)

Avian pathology, considered in its relation to comparative medicine, reveals that many human ailments have their more or less close counterpart in birds, and that, by a study of the extent of the analogy between these morbid conditions, a clearer insight has been obtained into the origin and development of disease.

The best example of research, guided by these principles, is the work of Ross (1898) in India. The transmission of *Plasmodium danilewskyi* to the sparrow by means of *Culex fatigans* resulted in the solution of the main problem of malaria.

Part of the original work of Ehrlich, Koch and Weigert (1884) on tuberculosis, which culminated in the isolation of the cause of this disease, was done with fowls, where the acid-fast microbe is present in greater numbers and more easily detected than in the corresponding lesions of mammals.

Further examples will be mentioned in the course of the following remarks, in which, to illustrate these views, certain typical morbid conditions which the author has often observed in birds and mammals have been selected.

HÆMO-SPIROCHÆTOSIS IN BIRDS AND MAMMALS.

The spirochætal fevers form a coherent group, whose signs and symptoms can be studied in many different animals, and prevention and treatment are readily comparable.

The microbic cause of these diseases is a spiral protist, whose prototype is the *Spirochæta obermeyeri*, originally discovered in the blood of man in 1868, thus being the first protist definitely recognised as the cause of human disease; in this instance the European variety of relapsing fever [Wechselfieber (German), Vosvoratni typus (Russian)].

The analogous avian spirochæte was discovered by Sakharoff (1892) in geese in the Caucasus, and different strains of this hæmoparasite have been since described in birds from all parts of the world.

Marchoux et Salimbeni (1903) found that a hæmo-spirochæte of poultry in Brazil was transferred by the fowl tick *Argas persicus*. This discovery led to the recognition of the part played by ticks in disseminating different varieties of relapsing fever in many parts of the world, more particularly the Central African variety of the fever, which Dutton and Todd (1905) proved was due to the tick *Ornithodorus moubata*. The mode of transmission of the European, Asiatic and North African varieties of relapsing fever still remained obscure for a considerable period, though several observers considered them louse-borne fevers. Eventually Nicholle (1910) and Sergent et Blaizot (1911) demonstrated experimentally that the bite of the body louse could not transfer a hæmo-spirochætal infection; but if a small quantity of cœlomic fluid of a crushed

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Pediculus vestimenti was placed on the abraded skin, or even conjunctiva, infection took place regularly.

In cattle and small rodents spirochætal diseases are also known, but the disease runs a much milder course than in fowls and man. Brumpt (1919) has shown that transmission of cattle spirochætosis can be effected by the tick *Margaropus australis*.

It will be easily seen that the original observations of Sakharoff (1892) and Marchoux et Salimbeni (1903) on birds have been followed by a gradual elucidation of the problems connected with the pathology, prevention and treatment of spirochætal diseases in man and animals, for arsenical preparations are efficacious against all varieties of spirochætal fevers.

Hæmo-spirochætes are well adapted to parasitic life in ticks; a female tick will transmit the spirochæte to its progeny through successive generations.

Specimens Demonstrated.

(1) Living *Argas persicus*; eggs and hexapod larvæ.

(2) *Spirochaeta anserina* var. *gallinarum* in blood of fowl.

(3) Bone-marrow of fowl with chronic spirochætosis, showing osteoid formation, as a result of myeloid irritation; anæmia being a common symptom of chronic spirochætosis.

Fowl-pox Virus and its Lesions.

There is a certain similarity between fowl-pox and its ætiological counterpart in man, molluscum contagiosum. On the other hand, fowl-diphtheria is an instance of an avian morbid condition whose clinical resemblance to human diphtheria is most striking and yet originates through the action of a virus or microplasm, with a superadded bacterial infection.

The outstanding feature of the virus of both these diseases is its proliferative reaction on the epithelium of fowls and the production of "reactive" bodies in the protoplasm of the cells invaded.

Specimens Demonstrated.

(1) Earliest stage of epitheliosis contagiosa in the pigeon. Round-celled perivascular infiltration.

(2) Later stage, twelve days with abundant proliferation, swelling of epithelial cells and production of chlamydozoic bodies.

(3) Later stage, three weeks, a thickened tumour-like growth, with proliferating connective tissue elements.

Fowl-Leucocythæmia and Erythromyelosis.

Fowl-leucocythæmia and erythromyelosis can be clinically compared with similar diseases in man. The possible analogy in their causative factors may bring about the elucidation of the obscure pathology of certain human "blood-diseases."

Fowl-leucocythæmia is a disease caused by a "virus," which according to the researches of Ellermann and Bang (1908), is Berkefeld filterable.

Erythromyelosis I have been able to observe in twenty-five white leghorn fowls; the signs of the disease are a peculiar yellow tinge of the comb, wattles and legs; erythrocytes 1,200,000 or even less (instead of three millions normal); hæmoglobin on the Sahli scale 10 to 15 degrees instead of 60 normal.

This peculiar condition is the outcome of a massive infestation of the duodenum with a cestode *Davainea proglottina*. The deleterious action of the helminth is apparent through the fibrinous thickening and petechial punctiform hæmorrhages on the walls of the intestine. The intestinal parasite by itself cannot produce the progressive condition of erythromyelosis, but requires the addition of a "virus-like" cellular irritant; this causes the erythroblasts to proliferate; the blood is swamped with immature erythrocytes whose nucleus is pyknotic, and whose protoplasm is poor in hæmoglobin.

Since February last year I have been attempting the transference of this condition by injections of blood and cellular suspensions from diseased to healthy fowls. I have only succeeded in obtaining transitory symptoms of paleness of comb and anæmia in single fowls of the same breed; the others proved resistant.

Lately, after careful examination of the bone-marrow and blood of the negative cases of the same breed, I became aware that some of these were suffering with a condition of definite hypererythrocythæmia with 4,800,000 red blood corpuscles and 107 degrees of hæmoglobin on the Sahli scale. The erythrocytes stain very uniformly, the nucleus is clear and sharp.

Controls have been examined and it has been found that at most, in certain instances, the hæmoglobin may reach 85 degrees and the erythrocytes four millions.

Are these observations in any way applicable to human pathology? The anæmia occurring in man as a result of *Bothriocephalus latus* infestation has been a puzzling problem for many years, as it is frequent in some parts of the world (Baltic provinces), and not others (Switzerland). If it is possible to prove the existence of a proliferative virus in the erythromyelotic fowls, this observation may lead research into new directions in similar diseases in mammals.

Specimens Demonstrated.

(1) Bone shafts showing extensive eburnation as a result of erythromyelotic process (macroscopic specimens).

(2) Active stage of erythromyelosis in the bone, showing centres of activity in the marrow and extensive medullar osteoid tissue formation.

(3) Later stage, showing substitution of red bone-marrow by osteoid tissue.

(4) Slides of blood in erythromyelosis.

(5) *Davainea proglottina* in the duodenum of a fowl with erythromyelosis.

Fowl Sarcomata and Similar Avian Tumours.

The histological and oncological resemblances between the fowl-sarcomata and certain sarcomas seen in man has been remarked since the discovery of the filterability of some of these fowl neoplasms by Peyton Rous in 1910. Pentimalli (1915) and Teutschlaender (1917) have described similar fowl-tumours the cause of which will pass a filter impermeable to most bacteria.

Not all spontaneous tumous of fowls are equally malignant; those of Pentimalli and Teutschlaender can be cured by operation even when they have reached a fair size.

The strain of Rous-fowl-sarcoma of the Bland-Sutton Institute of Pathology is inoperable later than the tenth day after inoculation with intact cells; then, however

complete the excision, recurrences form within a few days and kill the fowl within three weeks. This strain of fowl sarcoma resembles some extremely malignant myxosarcoma of the peritoneal cavity in man. Both Teutschlaender's and Pentimalli's strains are similar to this tumour, but the preponderance of myxoid fusiform cells is not so evident.

I have had occasion to observe five different spontaneous tumours in fowls and find their transference to other fowls difficult ; the usual course being a temporary graft, a slow period of increase and then complete readsorption. In this again they resemble mammal tumours.

Summarising therefore these observations, one cannot but notice that the peculiar filterability of the tumours of the Rous type is an exceptional peculiarity among fowl tumours ; and that the majority of other avian neoplasms behave in the first generations like mammal tumours, for they are only transferable with difficulty by grafts of tissue and not at all by filtrates.

Specimens Demonstrated.

(1) Sections of different spontaneous fowl tumours.

(2) Sections of Rous, Pentimalli, Teutschlaender, and Fujimami fowl neoplasms.

(3) *Cytodites nudus*, an acarus often found encysted in the loose connective tissue of fowls.

Conclusions.

A review of the most important avian parasitic infestations and infections shows that few pathological conditions in fowls have their exact counterpart in man, so that every group requires separate comparison in relation to its ætiology.

It demonstrates that while only two or three diseases appear to be communicable from man to birds or *vice versa*, or even have a common origin, yet there is a degree of similarity between several pathological conditions of fowls and those of man which is distinctly encouraging as a subject for comparative investigation.

Therefore, advancement in the knowledge of avian pathology, in which experimental investigations usually deal with relatively simpler conditions, may conceivably be followed by a better understanding of certain important and obscure mammalian diseases.

Discussion.

Dr. F. C. Minett said that Dr. Bayon's paper had interested him greatly, especially with regard to the subject of fowl-pox on which he (the speaker) had made a few researches in collaboration with Mr. T. M. Doyle, of the Ministry of Agriculture. Experience in several cage experiments had shown that the disease was transmitted by close contact between infected and healthy birds. Most probably this was the result of pecking, since if the infected birds were separated from the healthy by wire-grids arranged so as to prevent direct contact, transmission did not occur.

In testing the filterability of this virus, by using different filters and by adopting different methods, they had obtained weakly active filtrates in three or four out of twenty trials. Like many other observers they could not obtain virulent germ-free filtrates with any degree of constancy. He would like to hear something from Dr. Bayon's experience as to the relationship between cow-pox and fowl-pox virus. Certain observers (*v.* Heelsbergen, Toyoda, Pandit) had announced the successful transformation, by various expedients, of fowl-pox virus into cow-pox virus. Their own attempts to do this by the intradermal inoculation of rabbits had failed. The converse experiment, viz., the attempt to produce typical fowl-pox nodules on the combs of fowls by successive passage with cow-pox virus, had also failed.

With regard to infectious leukæmia, Bedson and Knight found experimental work on this disease particularly troublesome owing to the small number of birds—perhaps two or three out of twenty—which gave successful " takes." In view of the effect of the " race " factor in takes with the sarcoma virus, it would be advantageous to know whether there was a similar factor with the leukæmia virus.

It was evident from Dr. Bayon's lecture that by the study of the natural diseases of the fowl, knowledge of considerable value to human pathology might be obtained. An instance which came to his (the speaker's) mind was the survival of *Bacillus pullorum* in the gall-bladder wall of carrier fowls in bacillary white diarrhœa, an exact analogy with what took place in carriers of human typhoid.

Mr. J. Jackson Clarke said that (1) when quite freshly-excised lesions of *Molluscum contagiosum* were suitably placed in water, after four days some of the specific corpuscles would be found to be in a state of vital activity ; and (2) when fresh lymph from an ordinary vaccine vesicle was spread on a slide and treated with a combined fixing and Romanowsky staining medium, numerous merozoites, just like those of malaria parasites, were revealed. The origin of these merozoites of *Cytoryctes* could be traced in sections of vaccinated corneas of guinea-pigs. The cytoplasms of the merozoites soon disappeared, but their karosomes persisted, some sub-dividing into minute granules. These granules he (Mr. Clarke) thought were a phase of *Cytoryctes vaccihæ et variolæ* (Guarnieri, 1892).

Dr. Bayon (in reply) said the Rous-fowl-sarcoma No. 1 differs from mammal tumours, since its cause can be easily separated from the tumour cells by filtration. Peyton Rous and his collaborators investigated forty-three fowl tumours, and found only three transferable and filterable ; and of these one grew extremely slowly and lost its virulence on desiccation. Pentimalli's and Teutschlaender's fowl tumours under certain circumtances take months to develop. Though a single drop of juice expressed from a Rous-sarcoma will transmit the neoplasm, it is extremely rare to find experimental fowls infecting each other with the sarcoma, though they frequently fight and get wounded.

I agree with Dr. Minett that it does not seem possible to convey the virus of fowl-pox into that of vaccinia by inoculating rabbits ; the experiments which seemed to bring about this change were performed in a vaccine institute, thus rendering accidental contamination possible.

With reference to Mr. Jackson Clarke's observations, the conclusive demonstration of a protozoal cycle is a matter of considerable difficulty, and one requiring much time and attention. There are many observers who hold that the reaction bodies found in vaccinia, fowl-pox, rabies and other " virus " diseases are protists ; others, again, consider them artefacts, so that arguments can be quoted in support of both these contradictory views.

It is claimed by a New York doctor, who has been experimenting with the effect of X-rays on eggs, that the longer the eggs were exposed to the rays the more females resulted when the eggs were hatched. Other experiments yielded hens above normal weight, and hens that began laying earlier than usual, while on the other hand it was found that X-rays tended to produce abnormalities, such as the absence of wings.—*Reuter.*

A Wellington (N.Z.) telegram says that the establishment by the British Government of a special quarantine station in the London Dock area has led to a modification of the present complete embargo on the importation of live stock into New Zealand from Great Britain owing to the danger of foot-and-mouth disease.—*Reuter.*

Pedigree Stock.

Cattle Disease and its Results.

Reprinted from "The Times," 14th May, 1928.

The difficult position in which the Ministry of Agriculture and the Government are placed in consequence of the recurring outbreaks of foot-and-mouth disease is fully recognised by farmers. The problems involved are known to be complicated and difficult. In view of the important issues at stake, however, it is felt that something more effective than the present measures must be attempted if further disaster is to be prevented.

The discussion in the House of Lords last week, at the instance of Lord Ernle, did not point to any appreciable improvement being in prospect. Lord Stradbroke sought to draw reassuring conclusions from recent reductions in the number of outbreaks, but stockowners remember similar fluctuations before, especially at this time of the year, and will not feel very confident of lasting improvement from periodical variations of the kind. The argument relating to depreciation in meat from extended compulsory, as compared with voluntary, detention in cold storage was also unconvincing, as there is said to be no authentic evidence to show the effect of chilling and freezing on the nutritive value of meat. At least, Mr. Guinness indicated as much in a recent reply to a question in the House of Commons bearing on the relative food values of fresh and chilled meat.

Severe Disappointments.

The necessity for pressing this matter on the attention of the Government grows more and more evident, for the position is in some respects more than disquieting. It is difficult to believe that the meagre programme of auction sales of pedigree live stock announced for the present season is not associated in some way with the disorganisation and distrust caused by the frequent outbreaks of foot-and-mouth disease. Stockowners have endured such severe disappointments, and suffered such heavy losses, that it is not surprising if they are losing heart, or, what is worse, are compelled by financial conditions to curtail expenditure to an extent that operates against the former system of disposing of surplus animals, even if it can be assumed that they have the animals to sell. Experienced breeders will declare that the cost of maintaining pedigree herds or flocks now precludes the possibility of deriving any reasonable revenue from them, and investigation may lead to the conclusion that inability to balance income and outlay, under the conditions obtaining during the past few years, is the cause of a change sufficiently pronounced to foreshadow results that would be deeply regrettable for the industry and the country. It has been fairly obvious for some time past that the number of pedigree herds and flocks was in danger of serious diminution, but there has not previously been anything quite so disconcerting—indeed, so alarming—in respect to the breeding of high-class live-stock as the significant shrinkage in the total of summer sales from individual herds and flocks. The position would be less perturbing if consignments to central sales had increased, but there is no appreciable alteration in this direction to set against the contraction in the list of annual or periodical sales.

It would be premature to conclude that there have been corresponding reductions in the numbers of pedigree cattle, sheep, and pigs in the country. Many herds and flocks of repute have been dispersed in recent years—to the great regret of supporters of the breeds affected—but the breed registers do not indicate any considerable decrease in the total numbers of good animals, or discontinuance of systematic registration.

New Method of Management.

But if the process of registration is maintained the method of management would seem to have been modified. The fall in prices for line-bred animals has compelled suitable restriction in the costs of production, and the attempted balancing of expenditure and revenue has involved, among other things, dispensing with former methods of selling the surplus breeding animals. The prices ruling at private auction sales have dropped to a level that ceases to justify the holding of such events. This cannot be regarded as other than unfortunate, both for what it means in itself and for what it implies for the future. It represents or foreshadows a change in our live stock industry that can only be regarded with profound apprehension and misgiving. Until the country can be rid of this blighting scourge of foot-and-mouth disease, and its disturbing menace, it is improbable that there will be appreciable improvement. The new quarantine station may help matters, but countries that are free from the disease—mainly parts of the Empire—will continue to be suspicious and anxious while a trace of the disease remains in this country.

Policy on Disease.

A point that calls for particular attention is the probable attitude of the nation towards the control or tolerance of foot-and-mouth disease. This may be a thorny subject, but its unattractive character should not be permitted to interfere with its impartial consideration. The question, indeed, is fundamental to any studied attempt to restore the farming industry to reasonable prosperity. At a recent meeting at Leicester, Mr. Lindsay Everard, M.P., warned farmers that there might be a danger of the public declining to pay compensation for animals slaughtered in connection with outbreaks of this disease.

The danger cannot be disregarded, it is true, and if anything of the kind happened it would be a serious thing for farmers, as the speaker observed. But would it be less serious for the community in general? In the present state of farming finances the country has more to lose by letting the disease run its course than have the farmers. Better times for the industry may return, it is hoped, but unless emphatic changes come about in the near future the abandonment of the present wise policy of fighting the disease as a scourge that would be disastrous if it became endemic in the country would only hasten the collapse of a basic industry that looks at the moment as if that end were unavoidable. It would be wrong, as well as unwise, to encourage the view that the principle of compensation is adopted and continued primarily or wholly for the benefit of agriculture. Stockowners would be the first, and possibly the greatest, losers if the present procedure were to be abandoned and the disease were allowed to run riot among our herds and flocks, but in the end the nation, it may be surmised, would have profound reason for deploring any course so foolish and short-sighted as to withdraw resistance to this and other devastating scourges.

Pure Milk.

In the broader and deeper view of the case this is more a national than an agricultural matter, and farmers would be ill-advised to be unduly alarmed by menaces of changes that would be so calamitous to consumers of meat, milk, and other animal products. It is inconceivable that the public, if properly informed, could be so wanting in understanding as to believe that they would improve their prospects of procuring cheaper and better milk and meat by allowing the live-stock of their own country to become a prey to disease. Not only would such a proceeding increase their dependence upon oversea sources, but it would render additionally suspect articles of home production, and whatever may be the popular, or even the official, attitude regarding foreign commodities, anything of a suspicious nature pertaining to the produce of this country will not be tolerated.

Before hinting at a change of policy, by threats or otherwise, it would be well to reflect, first, that the existing dislocation of animal husbandry is due to the subordination of farming claims to the supposed requirements of the consumers—for unquestionably the infection comes with articles imported from abroad; secondly, that the milk supply in particular would be gravely imperilled; and thirdly, that the public expenditure entailed would, in the light of Continental experience, be far greater than is the case under existing conditions.

Deformation in Chickens.

A Scientific Enquiry.

"A wide and profitable field for research is outlined by Professor W. J. Dakin, of the Department of Zoology, Liverpool University, who is asking for live chickens three or four weeks old which have failed to grow and which have remained practically without feathers," writes a correspondent to a recent issue of *The Times* "Every breeder must have had experience of such unfortunates, which in the generality of cases are knocked on the head with the consoling thought that even in the best regulated strains and from the most vigorous stock physical freaks of this nature may occur. The experienced practical breeder has drastic methods of dealing with weaklings; but in view of Professor Dakin's offer to investigate the causes of such deformation, it may be suggested that attention be paid to the more striking instances of failure to grow and feather in order to provide proper material for the inquiry.

"The featherless chick that will not grow up presents an entirely different problem from that of the weakling that dies from disease or from sheer lack of vitality. It is in no sense a victim of the ordinary chicken ailments. It eats fairly well, it runs about in its own stiff, painful manner, and in its efforts to live a normal life it reminds us of the crippled child that strives to keep pace with its fellows. Its trouble is fundamental rather than accidental; and though breeders may believe that such occurrences are rare, it would be interesting, to say the least, if scientific light were thrown upon the reason or reasons for such deformation.

"It is generally recognised that faulty conditions in artificial incubation result in weakly, crippled and even deformed chickens. In nearly every hatch we find a few chicks that require helping from the shells long after their more sturdy brethren are in the drying chamber; and so seldom do these prove to be worth rearing that the commercial-minded breeder makes a point of destroying them as an economic and a humane procedure. To associate the non-growing deformation with hatching conditions, however, it would first of all be necessary to have the record of the chick's development from the embryo stage, and even from the production of the egg. Breeders have been so little concerned about these deformities that few, if any, are in a position to recognise in the non-growing, non-feathering chicks the late-hatched birds that required assistance in the final stage of hatching; but practical acquaintance with incubation problems suggests the necessity of investigating this aspect of the question.

"While it may be assumed that deformation in chickens is due to some elemental deficiency which may be discerned by laboratory workers, poultry-keepers will be specially interested in the question whether such instances are avoidable and whether or not they indicate any fundamental errors in feeding and management. Incubation failures by no means reflect upon the vigour and activity of the parent stock; they are more likely to be attributable to unnatural conditions in the incubator. Yet we cannot entirely eliminate the possibility of hatching results being affected by the feeding and management of the breeding stock; and the practical man already is aware that fertility and 'hatchability' depend to a considerable extent upon nutrition. When all the circumstances are considered, therefore, the investigation which Professor Dakin has undertaken presents much wider scope than appears on the surface, since the factors to be taken into account include nutrition, embryology, incubation, and heritable characters."

Hæmophilia.

Although true clinical hæmophilia is plainly of less frequent occurrence in domestic animals than in humans, most veterinary surgeons who have had considerable experience admit that on rare occasions they have faced peculiar post-operative hæmorrhages which would be difficult to explain on any other grounds.

Everyone has observed the tendency to excessive and continuous bleeding following castrations and other operations. But these can usually be classified as secondary hæmorrhages—hæmorrhages more often the fault of the surgeon than of the hæmopathic state called hæmophilia. The hæmostasia did not hold because of faulty ligation, torsion, or crushing, sometimes on account of infections which soften the obturating clot, or on account of pre-existing disease of the vessel walls, mechanical violence, removing ligatures or packs too soon, etc. Bleeding from faulty hæmopexis—true hæmophilia—on the contrary, is encountered only on rare occasions, if ever, in veterinary surgery. These rare instances may not be due to faulty coagulation of the blood of the bleeding subject as is the case in human beings, notwithstanding that they are clinically analogous.

Hæmophilia of the type seen occasionally in animals is not likely to be confused with the ordinary run of hæmorrhages. It has pathognomonic features. The wound bleeds incessantly. It drips or oozes a thin pinkish blood of slow coagulability and in quantities dependent upon the size and the number of vessels involved. Compression arrests the flow but only as long as it is maintained and if new incisions or needle holes are made in fixing the pack, each one becomes a new outlet. But despite the undisputable existence of just such conditions, now and then, in animals there is still doubt, in the absence of confirming evidence, as to whether real hæmophiliacs actually exist among animals. The doubt is increased by the fact that hæmophilic hæmorrhages of this type in animals are delayed hæmorrhages. In the case of castrations, for example, the dripping does not begin immediately after the artificial hæmostasia ceases to act but occurs from one to as many as six weeks after the operation was performed. Instead of cicatrising in the usual manner, the wound, when healing should be complete, is found dripping, notwithstanding that there is no local condition to account for the unusual phenomenon. Such incidences (there are a number of them on record) would indicate that the hæmophilic state was acquired and was probably related to the operation, to an unknown infection, either local or general, having a curious hæmolytic action. There is no study in veterinary medicine to confirm or refute the infection theory nor to attribute the phenomenon to faulty hæmopexis of hereditary origin as can be done in human medicine. And yet, the tendency to excessive, rebellious bleeding as well as the more rare incidents of delayed and incurable dripping should not be unexplainable were more attention paid to researches on hæmatology and its relations to our every day work—one of the weak links in the progress of veterinary science.—*The North American Veterinarian.*

Veterinary Inspection in Inverness.

At a recent meeting of the First District Committee of Inverness County Council it was intimated that the Scottish Board of Health would approve of the appointment of a part-time veterinary inspector under the Milk and Dairies Act. The Districts to which this arrangement applied were the First, Second, Third (Badenoch) and Fourth (Kingussie).

Mr. Alex. Munro, Leanach (the Chairman) stated that the First District, who would have to pay the highest proportion of the salary, were in the position of having 69 registered dairies as against 21 in the Second District and 18 in the Third. The First District had 1087 cows as against 300 in the Second. There was some difficulty in working out the basis of remuneration. Formerly it was on the basis of rental, but the conference decided that it should be on the cow population.

It was agreed that the terms of the appointment of the part-time veterinary inspector be subject to revision after every five years.

CLINICAL AND CASE REPORTS.

An Ultra-Rapid Fatal Termination to a Case of Tetanus.

By P. Dennis Dunn, M.R.C.V.S., F.Z.S.

Subject.—A ten-years'-old Carthorse gelding.

A chronological record of the progress and somewhat amazingly rapid fatal termination of a case of tetanus, may prove of interest, though not, of course, unique in the known history of the disease.

May 5th, 1928.—Horse picked up a large nail insufficiently buried to produce immediate lameness. Owing to bad stable management and lack of observation on the part of the driver, the nail was left *in situ* until 6-0 p.m. on May 6th.

May 7th.—Area in foot thoroughly pared out, bathed and packed with tow and antiseptic, and re-shod with a leather sole. Horse perfectly sound, and sent to work.

May 8th.—Horse re-examined by myself. Still quite sound, eating well, no temperature and apparently normal.

May 9th.—4-0 p.m.—Horse a bit sluggish at work.

5-0 p.m.—Commenced to take feed. After eating about half of it, stopped and stood away from the crib.

5-30 p.m.—Teeth firmly locked. I saw the animal at 6-0 p.m., when tetanus was fully developed, but all the symptoms were confined to the head and neck—no stiffness in the limbs, tail, etc. Anti-tetanus serum (30,000 units), now administered and the usual hospital technique carried out, *i.e.*, dark box, quiet, etc., etc.

May 10th.—9-0 a.m.—Disease obviously advancing, back and tail now affected, 1½ ozs. conc. mag. sulph. injected into the subcutis of the neck. Exceedingly nervous and difficult to handle, even with great quietude.

7-0 p.m.—Fatal termination.

Conclusions.

1. The fact that the nail was left in the foot thirty unnecessary hours is undoubtedly, in some measure, the reason why the symptoms were so pronounced immediately the incipient stage was reached, but even allowing for that, the almost hourly increase in intensity of the symptoms, and death *26 hours* after first symptoms appeared, is noteworthy.

2. Comparatively large doses of serum apparently, in this case, could not even neutralise fresh toxins elaborated from the wound.

3. The virulence of the infection must have been extraordinarily intense to produce such sudden and complete trismus.

4. The membrana nictitans showed no loss of nervous tone until other symptoms were noticeable. This, in my experience, is also unusual, and tempts one to ask, is the early protrusion at the third eyelid (*e.g.*, 24 hours before the onset of the other diagnostic symptoms) a favourable prognostic indication?

Adherent Pericardium as a Cause of Sudden Death in a Cart-horse.

By J. W. Rainey, C.B.E., M.R.C.V.S., London.

In April, 1928, an inspector of the R.S.P.C.A. on duty on what is locally known as the "Iron bridge," at Canning Town, London, E., observed a horse hauling, with what seemed distressing difficulty, a considerable load up the gradient towards the crown of the bridge.

As the inspector went forward to speak to the driver the horse fell down and, after once raising its head from the ground, died.

Profuse lachrymation occurred at the moment of death. There was no struggle.

A *post-mortem* examination, made the same day, showed that the pericardium was adherent to the front of the heart, from the apex towards the base, over an area of several square inches. By using force it was possible to strip off the adherent pericardium to some extent, but near the apex of the heart the union was so complete that it could not be stripped. The veterinary surgeon who attended by contract to the horses of the firm of contractors owning the animal affirmed that there was no record of the horse having been ill within the past year, and that the animal had been regularly employed in hauling loads up to two tons. Apart from this subjective evidence, it might be supposed that the horse had in fact passed through an attack of acute pericarditis, not earlier than the preceding winter. It is difficult to imagine that so gross a lesion as described above could have developed without any obvious symptoms during life.

A Case illustrating the resistance of the Dog's Peritoneum to Infection.

By J. McCunn, M.R.C.V.S., M.R.C.S., L.R.C.P., Professor of Anatomy, Royal Veterinary College, London.

Three-and-a-half years ago a cross-bred Terrier dog was brought to me for examination. The case was one of purulent endometritis, and operative measures were advised.

The dog was operated upon in the usual manner and as the owner was a poor man it returned home the same evening.

Catgut was used for the deep sutures and silk worm gut for the skin.

The next day the owner was waiting for me at the surgery at 9 a.m. He had carried the dog, and said that it had suddenly attacked the wound and opened it. Several feet of intestine were protruding from the wound and the dog had been walking about with this injury for some minutes before it was noticed.

The peritoneal surfaces were soiled and I despaired of any recovery.

The bowel and peritoneum were cleansed as well as possible with warm eusol solution and the wound repaired. The animal was kept in the infirmary under observation.

Everything went well for two days, when the kennel man, on arrival in the morning, found the dog standing in the kennel with bowel protruding and dragging on the floor.

The projecting viscus was nearly black, soiled very badly and covered with sawdust.

The affected part was again cleaned with warm eusol and spirit, a most difficult job, the edges of the wound trimmed and the wound closed.

Everything went well again for two days. On the evening of the second day the dog was again found with intestine protruding and soiled.

I despaired of any good result, but, yielding to the owner's wishes, made another attempt. On this occasion, to close the muscle tissue I made use of a wire filigree, made of strands of fine silver wire : strong silk ligatures were also used.

Instead of the usual bandages a dressing was stitched on to the skin.

This time the dog left the wound alone and good union resulted.

The silver wire was removed at a later date owing to the occurrence of a small swelling.

During the last week of April, 1928, the dog was brought to the surgery for destruction owing to age and gradual weakness.

A *post-mortem* was made. The peritoneum was perfect ; there were no adhesions, with the exception of an omental one attached to the line of the wound. The union of the muscles was perfect and the skin scar was small.

I report this case in order to illustrate the fact that the dog's peritoneum is, in my opinion, much more resistant to infection than is generally supposed.

Three Weeks' Follicular Mange Cure.

By D. BUCHANAN, D.V.S.M., M.R.C.V.S., Edinburgh.

The following case illustrates the fact that, providing an efficient agent is thoroughly applied, an early cure of what would seem to be an uncompromising case of follicular mange can at least be expected.

SUBJECT.—Five months'-old pedigree Airedale terrier.

LESIONS.—The skin from the eyes backward to the occiput was devoid of hair, thickened and noticeably wrinkled with the presence of numerous minute hard nodules and scaly materials. On each side of the face and in the intermaxillary region and over the elbows were thick crusts or scabs which extended under the neck downwards towards the sternum. The well-known bluish or copper-coloured appearance of the skin was seen over a small area on the cheek. Three nodules had appeared over the lumbar region. The contents of several of the nodules with hairs and skin scraping were forwarded for examination to Professor Matheson, of the Edinburgh Veterinary College, who, in a report dated 27th March, 1928, stated that the *Demodex folliculorum* was present in the material submitted. The owner was notified, and after some difficulty was persuaded to have the dog treated.

TREATMENT.—*March 28th.*—The whole body was clipped and the dog bathed in an orthodox mange dressing with the object of producing general cleanliness and skin activity. Cod liver oil was prescribed and exercise, sunlight and fresh air advocated.

March 31st.—The treatment recently described by Mr. J. C. Jackson, M.R.C.V.S., in the *Veterinary Record* was carried out with slight modification. The whole body was thoroughly hand rubbed with " Odylen " [a combination of an oil—sulphurised in the nucleus—and high molecular ketones.—Ed.], at least forty-five minutes being spent over the process. Apart from the lesions themselves, special attention was given to such places as the intermaxillary space, between the toes, behind the pasterns, inside elbows and thighs, and the root of the tail. A rotatory movement was found to be most satisfactory in ensuring the saturation of the pores of the skin. The larger nodules were squeezed out and their contents carefully wiped away, " Odylen " being later applied. An injection of " Aricyl " [a di-sodium salt of acetarsinic acid.—Ed.] 1 c.c. was also given.

April 2nd.—On this date a marked improvement was noticed, nearly all the nodules having disappeared. " Odylen " was thoroughly rubbed into the affected parts only and a further injection of " Aricyl " 1 c.c. given.

April 4th.—Lesions again treated and injection of " Aricyl " given as above. Hair was now commencing to grow over the area previously bald.

April 6th.—Improvement maintained. The whole body was again rubbed with " Odylen " and an injection of " Aricyl " given.

April 9th.—Great improvement. A final injection of " Aricyl " was given.

April 13th.—With the exception of a slight scab persisting over the right elbow and on the chin, with a little scaly material over the right eye, the condition could almost be said to be cured.

A final application of " Odylen " was now given to the whole body.

April 18th.—No further trace of follicular mange could be seen, the growth of hair and general appearance of the coat being perfect.

The animal was not given a bath, and when last seen on April 28th, was in a thriving condition. A further series of " Aricyl " injections was considered unnecessary.

In conclusion, I must express my indebtedness to Mr. J. C. Jackson, M.R.C.V.S. for his description of a line of treatment which I have found to be successful.

ABSTRACTS.

[Infection of Man by the bacillus of infectious Abortion—Bang, by Dr. E. GRAUB BERN. Translation of an extract by Dr. Habl in *Prager Archiv. fur Tiermedizin* 15 Feb., 1928 from *Schweizer Archiv. fur Tierheilkunde* LXIX Band 7 Heft Juli 1927.]

In the latest medical publications from Italy, America and France, the probability is brought out that, under certain circumstances, the Bang bacillus causes a feverish condition in man. The disease-picture is similar to that of Mediterranean fever (Malta fever), which is due to the *Bacillus melitensis* (indistinguishable morphologically and biologically from *Bacillus abortus* of Bang). *Bacillus melitensis* occurs in goats of countries around the Mediterranean. The disease infects man through the use of milk from diseased goats.

[Urea for Warts, by D. PIETZSCH. Translation of an extract by Dr. Schwansee in *Prager Archiv fur Tiermedizin*, 15 Dec., 1927, from *Zeitschrift fur Veterinarkunde*, Berlin H9, 1927.]

According to Stoeltzner and Stoye, urea was found to occupy a foremost place as an adhesive dressing. Its

complete action develops as a 50 per cent. urea solution, that is urea and water in equal parts. The author had occasion to test this agent for warts on horses. It succeeded with him, when injected intradermally in the immediate neighbourhood of various warts, by bringing about their falling off, whereby in addition no cicatrisation of any size remained afterwards.

[On the Question of Tuberculosis in the Dog. KONGE, W. (1928). *B.T.W.*, XXXXIV, No. 16, pp. 265-6.]

A report on three cases in the Dog :—

(1) *Irish Setter.*—Clinically, pulmonary emphysema, emaciation and "greying" of the hair on head (dog was four years old). Tuberculosis suspected and, treatment being of no avail, animal killed. *Post-mortem* showed extensive hypertrophy of bronchial glands (T.B. bacilli demonstrated in sections) and lung emphysema.

(2) *Pointer.*—From the same dwelling house as No. 1, with the same clinical and pathologo-anatomical symptoms.

(3) *German Sheep Dog.*—Three and a half years old, born and bred in open. Developed ascites, the cause of which was diagnosed as pericarditis. Treatment, including "tapping" of abdomen, without good results. Animal died about six weeks after commencement of ascites. *Post-mortem.*—The important pathological changes were: Lymph glands greatly enlarged; abdomen contained seven litres of fluid with greyish yellow flocculi; liver greatly enlarged, greyish with grey pin-head-sized areas; pleural cavity contained one and a half to two litres of reddish fluid. Pleura and mediastinum reddened and beset with a great many nodules varying in size from that of a pin's head to that of a pea; pericardial sac contained three wine glassesfull of red fluid, the pericardium being studded with greyish nodules.

Enquiry showed that the owner of the dog suffered from T.B.

PERSONAL.

A Welcome Visitor. Donald Gwatkin, V.S., D.V.Sc., Lecturer in Bacteriology, Milk Hygiene and Diseases of Poultry at the Ontario Veterinary College, Guelph, Canada, is visiting this country to obtain information in connection with his work at the College. He is at present at the National Institute for Medical Research farm at Mill Hill, and intends going to the Institute of Animal Pathology at Cambridge, the laboratories of the Ministry at Weybridge, the Pasteur Institute at Paris, and other Continental Institutes. We were very pleased to welcome Dr. Gwatkin as a distinguished visitor at the offices of the N.V.M.A., when he expressed the deepest appreciation of his reception here, and of the assistance given him in his work.

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Birth.—On May 23rd, at 5 Norfolk Road, Harrogate, the wife of R. S. Smyth, M.R.C.V.S., D.V.S.M. (Vict.), a son.

The investigations made by the laboratory staff of the Animal Diseases Research Association into the causes of lamb dysentery have now been concluded on the Wigtownshire moors. Several cases have been investigated, and there are hopes that as a result of this season's experiments it will be found that the *Bacillus welchii* antitoxin will confer a great degree of immunity from this disease, which has caused heavy losses in the past.

DIVISIONAL REPORTS.

Scottish Metropolitan Division.*

A meeting of the Scottish Metropolitan Division was held in the Hygiene Department of the Royal (Dick) Veterinary College on Wednesday, 25th April, 1928, the President, Professor R. G. Linton, occupying the Chair.

The following gentlemen signed the Attendance Book. *Members*: Messrs. A. Linton Robertson, Andrew Spreull, J. Ker, John Taylor, Wm. S. Lornie, A. Gofton, Major R. G. Anderson, Major Graham Williamson, Professor J. Russell Greig, Messrs. S. Robson, J. F. Player, John Aitken, Dr. O. Charnock Bradley, Messrs. Charles Weighton, A. Manson Larnach, Thos. P. Young, Geo. F. Boddie, Professor W. M. Mitchell, Messrs. Alex. R. C. Bowie, J. P. Walker, and the Hon. Secretary. *Visitors*: Messrs. A. G. Bull (Perth), J. R. Rider (Hon. Secretary, North of England Division), A. Spreull, J. N. Ritchie, W. L. Weipers, and W. M. Mackay.

Apologies for absence were intimated from Major A. Baird, Messrs. T. M. Inglis, H. Begg, H. M. Wilson, Wm. Anderson, Major J. G. McGregor, and Mr. Jas. Henderson.

Correspondence. Extracts of a letter from the President of the Scottish Branch were read, dealing with the desirability of raising funds from the constituent Scottish Divisions by voluntary measures, so that the finances, meetings and scope of the Scottish Branch might be arranged more adequately. This letter had been carefully considered by the Council, which met previous to the General Meeting, and they recommended that so far as this Division was concerned "a scheme of a *per capita* grant of 1s. for each subscribing member be initiated, the amount to be paid by this Division to the funds of the Scottish Branch." This was moved by Mr. Gofton, seconded by Mr. Taylor, and carried unanimously.

A letter was read from the Editorial Representative of the *Veterinary Record*, requesting that in order to enable the Editorial Committee of the *Record* to increase its value to the general practitioner, the members of the Division should endeavour to assist by sending in clinical articles for publication as often as possible. It was emphasised that a clinical article in the *Record* can, if the writer particularly desires, be published anonymously, and that if the busy practitioner has not time to forward a completed article it will be completed for him.

The letter was favourably received and there is little doubt that the members of the Scottish Metropolitan Division will continue to send in clinical articles at least as frequently as they have done in the past.

Election of New Members. Mr. A. Larnach, of Musselburgh, and Mr. Esmond Brown, of Edinburgh, having been nominated at the last meeting, were proposed by Professor J. Russell Greig, and seconded by Major Anderson, and duly elected as members.

Nominations. Mr. J. N. Ritchie, of the City Veterinary Department, was nominated by Mr. A. Gofton; Mr. T. S. Skinner, of Kirkcaldy was nominated by Professor Mitchell, and Mr. J. D. Ferguson, Crieff, was nominated by Mr. A. Linton Robertson.

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* Received on 2nd May.

The PRESIDENT briefly apologised for having been prevented from preparing a Presidential Address. He had been exceedingly busy, and having been away from Edinburgh, had had no time to prepare an address. He then introduced Mr. Miller who, he said, had formed one of an International Delegation which visited Algeria during last winter to examine and report upon the work of Voronoff and his assistants.

[A report of Mr. Miller's address is published separately in this week's issue.—Ed.]

After the lantern demonstration which followed the account of the operation, the President proposed a vote of thanks to Mr. Miller, which was heartily carried. Mr. Miller briefly replied. This concluded the business, and the meeting terminated informally.

WM. C. MILLER, *Hon. Secretary.*

Ayrshire Division.

ANNUAL GENERAL MEETING.

The Annual General Meet ng of the Ayrshire Division was held in the Ayrshire and Galloway Hotel, Ayr, on Thursday, 19th April, 1928. The Chair was occupied by the President (Mr. W. Gardner, Maybole), and there were also present Messrs. Alex. Douglas, B. Taylor, H. Gillmor, W. A. Macgregor, Jun., R. M. Smith, D. C. Smith, J. Donaldson, F. McD. McKenzie, and David Brown (Hon. Secretary). *Visitors*: Messrs. McDonald and Leckie.

The minutes of the last meeting of the Division, having received publication in the *Record*, were taken as read, and were confirmed.

The HON. SECRETARY submitted the financial statement, which was considered satisfactory and adopted unanimously.

A letter from the N.V.M.A. was read setting forth the desirability of members contributing original clinical articles to the columns of the *Veterinary Record*. The Hon. Secretary was instructed to acknowledge receipt of the letter and express the sympathy of the members of this Division with the recommendation, stating that they would fall in with the suggestion when the opportunity arose.

ELECTION OF OFFICE-BEARERS.

On the motion of Mr. Alex. S. Douglas, Wm. G. Forbes (Kilmarnock) was duly elected *President* for the ensuing year, and Robert M. Smith (Galston), on the motion of the Chairman, was elected *Vice-President*.

Mr. David Brown was unanimously re-elected *Hon. Secretary and Treasurer*.

The Chairman paid a warm tribute to the excellent qualifications of Mr. Brown for the duties of the office. He had the welfare of the Divi ion at heart, and was at all times the essence of helpfulness.

Having been Secretary to a kindred Society for some years now, he could claim to know some of the essentials to maintain the vitality of a Society, and an enthusiastic secretary and treasurer was one of the most needful. No Division is better served than their own in that direction.

He asked the members to give the Secretary their wholehearted support, and thus make for the success of their meetings, and his duties the easier to discharge. In so doing they would show their appreciation of his valued and helpful services.

PROPOSED BRANCH FUND.

The CHAIRMAN said that at the Annual Meeting of the Scottish Branch of the N.V.M.A., at Gleneagles, in October last, it was mentioned by the Chairman of the meeting that the Branch had no funds to enable it fully to carry out its functions, nor had it, at present, any means of raising funds. Personally he thought this was a regrettable state of affairs.

It was generally agreed that the annual meetings of the Scottish Branch had been most successful functions, and had been marked by contributions of outstanding interest by leaders in the world of veterinary science. In order to ensure that the Branch might continue to hold such meetings, it appeared to him to be necessary that the financial position of the Branch should be seriously considered by the Division.

The Council of the "National" decided last year that the sum of £5 per meeting should be paid by the Council towards the expenses of holding meetings of Branches, special application to be made for an increased grant in special cases. As that sum had to cover the cost of printing and circulating notices of meetings, secretarial expenses, hire of room and reporting fees, it would be seen that the sum of £5 might be quite inadequate for the purpose, particularly where the contributor of the paper had to come from a distance. He felt strongly that a fund, however small, must be raised somehow, and as President of the Branch for the current year he purposed endeavouring to put the Branch in a better position financially.

He had been advised by the General Secretary of the "National," in consultation with the Association's solicitor, that a Branch had no authority to raise money by levying contributions on its constituent Divisions. No objection could, however, be taken to the suggestion which he had now to submit for their consideration, namely, that in order to facilitate the satisfactory functioning of the Scottish Branch of the "National," that Division should make a voluntary annual contribution to a Special Branch Fund.

Such a fund, together with the £5 per meeting payable by the Council of the "National," would ensure the success of their important annual meeting, and relieve those responsible from any financial anxiety in connection with the meetings.

He might say, in conclusion, that he had sent forward this proposal, in similar terms, to the other constituent Divisions of the Scottish Branch, and he fervently hoped for a favourable reply from them to his suggestion.

It had been a pleasure and an honour to him to preside at their meetings during the past year. With the existent spirit of enthusiasm, their help and their hearty co-operation, his term of office had, indeed, been a happy one, and before he vacated office at this time let them say here and now that they intended to maintain the traditions of the Division as a real "live wire" of their parent body, "the National," and let each gladly consent to make a voluntary contribution towards his proposed Branch Fund. He felt confident that they would not "let him down" on that occasion, but give a lead to the other

constituent Divisions of the Scottish Branch, and so bring the work for that year to a successful termination.

After several members had entered into a free discussion, it was unanimously agreed to support the suggestion of the Chairman, and those present agreed to make a voluntary contribution through the Secretary, when called upon to do so, to be remitted by him to the Secretary of the Scottish Branch.

It was agreed that in future three meetings be held annually, viz., on the first Thursday in February, June and October.

INTRADERMAL TEST DEMONSTRATION.

In response to a request made at a recent meeting, Mr. ALEX. DOUGLAS, County Veterinary Inspector, had arranged to delay the slaughter of a cow which was being dealt with under the Tuberculosis Order, and submit her to the intradermal tuberculin test so that members might observe the reaction and afterwards make a *post-mortem* examination.

Mr. Douglas was able to have three such cows, and had arranged the visit to the slaughterhouse so that the various stages of the reaction might be observed; in one cow the test was completed, in the second case the observation was made forty-eight hours after the first dose, while the third cow had received the first dose twenty-four hours previously.

The skin measurements in the first cow were 7 m.m. initially, 13 m.m. at 48 hours, and 19 m.m. at 72 hours; the swelling was diffuse and painful. To the first ophthalmic dose there was a marked reaction, but to the second dose the reaction consisted only in marked congestion.

With the other two cows the initial measurement was 5 m.m., and at the time of observation the measurement was 13 m.m. in each case; the swellings were diffuse, hot and painful.

Though the completed test in the first cow did not show an enormous reaction, Mr. Douglas had no hesitation in regarding the result as quite definite, while with the other two incomplete tests he felt certain that these also were reactors.

A young bull awaiting slaughter had also been given a dose of tuberculin in the hope that members could have compared the distinctive enlargement seen in a non-reactor with a reaction, but this bull also gave indications of being a reactor.

The *post-mortem* examinations showed the three cows all extensively affected with tuberculosis, while several small lesions were found in the bull's lungs.

The members afterwards partook of tea together and spent a pleasant hour in general discussion.

A hearty vote of thanks to the Chairman brought a successful meeting to a close.

DAVID BROWN, *Hon. Secretary.*

Circumstances have combined in recent years, says the *Times*, to make the position of the summer grazier more precarious and difficult. There has been no easing of the situation this season. From all accounts the stocking of pastures has been exceedingly delicate and difficult. In the first place the supply of store cattle in particular has been inadequate to meet requirements, and prices have risen to levels beyond what graziers could afford to pay and retain any hope of "getting out" without heavy loss in the autumn.

STUDENTS' CONTRIBUTIONS.

Cystotomy and Urethrotomy for Urinary Calculi.

By D. E. WILKINSON, Class "D," Royal Veterinary College, London.

On January 2nd last I was invited to operate upon a dog which had frequently voided blood-stained urine and in the bladder of which a calculus had been detected by palpation through the rectum.

The patient, a wire-haired Fox terrier dog, about 20lbs. weight and 7 years' old, in very gross condition, was prepared for operation by being kept upon a milk diet for two days and by the administration of 5 grains of hexamine three times a day.

Early on the morning of January 4th a dose of castor oil was given and the dog exercised until his bowels acted freely. He was then brought in by car, a distance of 20 miles, and allowed to run about until he emptied his bladder. One grain of morphine sulphate was then administered hypodermically. This produced vomition, and, in about twenty minutes, fairly deep narcosis.

The dog was then placed on the operating table in the dorsal position, the abdomen shaved and painted with iodine and chloroform administered.

A prepubic incision, about three inches long, was made through the skin, muscles and peritoneum on the left side of the penis and the bowels drawn through this and through a window in a sterile cloth upon which they were laid.

Owing to the very fat condition of the patient it was found necessary to enlarge the incision to about 5 inches in length before the bladder could be properly manipulated. It was then quite easy to feel a calculus in the upper part of the bladder and quite firmly attached to its mucous membrane.

Before incising the bladder a catgut suture was passed transversely through the serous and within the muscular coat, for about half-an-inch, tied in a loop and held by artery forceps, to assist in the manipulation of the organ.

An incision about three-quarters-of-an-inch long was then made into the upper portion of the bladder, in the horizontal plane of the body, avoiding any visible blood vessels, the calculus gently seized by forceps and rotated to free it from its attachment to the mucous membrane and then withdrawn. The mucous membrane was seen to be very swollen and congested, but the resulting hæmorrhage was negligible. After swabbing out the bladder with a solution of chinosol and making sure that no fragments of the calculus were left free within it, the wound was closed by interrupted sutures of No. 0 catgut, inserted with a milliners' needle, the catgut suture which had been used to retract the bladder being utilised as one of these sutures in order to avoid unnecessary wounding.

The other viscera were returned and the external wounds closed by two layers of interrupted silk sutures.

Except for slight colic for the first two days after operation, recovery was uneventful. It was necessary to remove a few sutures on the fourth day owing to the amount of serous exudate from the wounded muscles. After treatment consisted of the administration of hexamine and hyoscyamus three times a day for ten days, the fitting of an

Elizabethan collar to prevent licking of the wound and a milk diet.

The patient returned home on January 22nd.

On February 14th he was again brought in for treatment as his urethra was obstructed by calculi. A catheter was passed and one calculus located just behind the posterior end of the penial bone. This was removed by urethrotomy and an attempt made to pass the catheter into the bladder, as very little urine followed the removal of the calculus. The catheter was arrested by another calculus above the ischial arch so that another incision in the perinæal region was necessary in order to remove it by forceps. This was followed by a gush of blood-stained urine from the distended bladder and by the marked relief of the patient.

The bladder was washed out daily by means of an udder inflation syringe passed through the perinæal wound and a sterile catheter passed up the penis and into the bladder daily to prevent stricture of either wounded part of the urethra. The dog passed urine through both wounds for some time, but by March 17th, they had healed and he returned home.

He remained in apparent good health until April 16th. On that day he went for a five mile walk with his owner and frisked about in excellent spirits. At night he was in great pain owing to retention of urine and I was summoned to see him.

On arrival I found the pressure of the urine had burst open the recently-healed perinæal wound, giving him some relief as urine constantly dribbled from it.

Exploration by catheter and sound revealed the presence of another calculus, the size of a split pea, at the posterior end of the os penis, and as the case offered no prospect of a permanent cure, owing to the rapid formation of calculi, the patient was destroyed by anæsthesia.

The calculus removed from the bladder at the first operation consisted of calcium-ammonium phosphate and was as large as the kernel of a filbert and presented a very roughened surface, blood-stained from its attachment to the congested mucous membrane of the bladder.

Congenital Malformation in a Litter of Puppies.

By H. S. Purchase, Class "D," Royal Veterinary College, London.

In a litter of five Fox-terrier puppies, three were noted to have a peculiar gait. On examination one was found with both fore-limbs affected while the other two were affected in the near-fore only. The olecranon process could be felt displaced outwardly with its articular surface related to the external epicondyle and the grooves on the lower epiphysis of the humerus could be located.

The paws were placed on the ground in the normal way and to accommodate this the relative position of the ulnar and radius was altered. The elbow joint could not be fully extended. The animal with both limbs affected walked with a gait very reminiscent of that of a polar bear. Manipulation to replace the bones to their correct positions failed.

The litter was not being well nourished owing to the bitch having a sparse supply of milk. Feeding with "baby" foods was advised for a time. When next visited they were eight weeks' old and in good bodily condition. The gait of the pup with both joints affected was pitiful, as it had sunk down on to its elbows and the nose trailed on the ground. The others limped badly and the displaced olecranon was very unsightly.

The worst affected was destroyed with a hope that information might be gathered as to the possibility of an operation on the others. *Post-mortem* revealed complete dislocation of the joints. There appeared to be no well-marked external lateral ligament, whilst the medial ligament was represented by a short joining band of fibres. Attempts were made to replace the joints, but even brute force failed. The other two were subsequently destroyed and on autopsy showed similar dislocation.

It is interesting to note that:—

(*a*) The two normal animals were both bitches, while the affected were dogs.

(*b*) There was no trouble or difficulty in whelping.

(*c*) All other joints were normal.

(*d*) The malformation was noted immediately after birth.

Sporotrichosis.*

By Captain Floyd C. Sager, U.S. Army Veterinary Corps.

Sporotrichosis is a chronic disease of man and equines, characterised by the formation of nodules and ulcers on the skin and subcutaneous tissue which do not disturb the general condition of the patient. In man this condition was formerly confused with tuberculosis and syphilis; in equines it was, and still is, frequently confused with epizootic lymphangitis and cutaneous glanders. The causative agent was first discovered by Schenck in 1898. It is a fungus known as *Sporotrichum schenki*. The Sporotrichum is a cylindrical, segmented, more or less branching thread-like growth which carries pediculated or unpediculated spores at the sides or ends. Text books state that it is usually extremely difficult if not impossible to find the organisms in direct examination of the pus. This, however, does not seem to be the case, as the organisms may be demonstrated with no particular difficulty. The examination may be facilitated by clearing the pus with 4 per cent. NaOH or by staining with any of the basic stains, such as methylene blue, gentian violet or fuchsin. The fungus and spores are gram positive.

Cultural Characteristics. As a rule the organisms can be found only by making cultures from the pus. In collecting this pus it is best to select a nodule which is just about to rupture, clean the surface carefully and incise it, making the inoculations from the deeper pus. Tubes of 4 per cent. glucose agar are heavily inoculated on the surface and incubated at room temperature. The growth appears in from four to six days as minute gray flecks which are soon surrounded by a delicate fringe. They may be white or slightly brownish. The Sporothrix grows on medium of very simple composition but grows more luxuriantly on those containing sugar. On glucose broth it forms a thick membrane. It will liquify glucose gelatine

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but will not clot or digest milk. It will ferment lactose but not saccharose.

Occurrence. Sporotrichosis is a common disease of man in France and Switzerland, but it is very rare in the United States. Up to 1912 there had been but twenty-eight cases reported in this country. It occurs commonly in horses and mules in Madagascar, and has been found in the United States. The disease was first seen in this country in a small section of Beaver County, Pennsylvania, where it is still common. I have seen a positive case in Kansas, and a typical case, though not confirmed by laboratory diagnosis, in North Western Nebraska. This latter case was an animal which had been originally shipped into the state from Iowa. Major C. W. Greenlee, Veterinary Corps, United States Army, has seen the disease in Arkansas, Texas and Pennsylvania.

Symptoms. The disease is almost sporadic in its occurrence, although it may be said to be endemic in the district in Pennsylvania previously mentioned. It cannot be said to be infectious, as only one animal in a large group may be affected. It is manifested by the development of, first dense and later suppurating nodules. These nodules may appear on different parts of the body, but in about 90 per cent. of all cases the nodules are confined to the hind legs and of these about 90 per cent. are limited to the right hind leg. Nodules followed by ulcers, easily mistaken for glanders lesions, may occur on the nasal membranes. Cases have been reported in which the liver was also affected. Although text books state that the lymph glands and lymph vessels are not affected during the course of this disease, in a high percentage of cases, especially those showing lesions on the hind legs, the nodules follow the lymphatics. The nodules are first noted as thickened areas in the skin from 0.5 to 2.5 cm. in diameter. These areas are not sensitive nor do they seem to cause the animal any discomfort. They gradually soften in the centre and later rupture, exuding a small quantity of creamy yellow pus. This discharge may or may not be streaked with blood. The ulcer, so produced, is very similar to the ulcer of epizootic lymphangitis. The ulcerated nodule has the appearance of a truncated cone, the top of which is ordinarily elevated about 0.5 cm. above the level of normal skin. The margin of the ulcer although somewhat elevated does not appear to be appredably thickened. The individual nodule heals readily without treatment, leaving a thickened area in the skin with a small denuded scar area where the nodule ruptured. After the disease has progressed for some time, the nodules spread out from the original area of infection, extending usually in the direction of the lymphatics. As the nodules increase in number, the skin takes on a thickened roughened appearance, while the small denuded areas tend to give the delusion of ringworm infection.

Diagnosis. Sporotrichosis must be differentiated from epizootic lymphangitis and cutaneous glanders. This is easy in the case of epizootic lymphangitis as this disease does not occur in this country, and glanders can be eliminated by a negative mallein test. A diagnosis of sporotrichosis is established when gram postive, thread-like growths are found in the pus which show a club shaped enlargement on one end and vacuoles in the inside together with gram positive spore-like granules. It may, however, be confused with some of the ringworm like type of fungi among the higher order of moulds.

Treatment. Potassium iodide is specific. It is administered in 2 dram doses twice daily on the grain ration. If the animal refuses the grain because of the presence of the drug, withhold the grain for one day and then give a small quantity with the potassium iodide mixed well through it. At the first sign of abnormal lacrimination or serious nasal discharge, stop the administration of the drug for seven or ten days or until all signs of iodism have disappeared. Then repeat the treatment. Cases so treated ordinarily make an uneventful recovery which usually occurs in about four weeks.

References. Hutyra and Marek : Hiss-Zinser Russel.

Acknowledgment is made to Major C. W. Greenlee for advice and criticism on the preparation of this paper.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

June 4th—Meeting of Editorial Committee N.V.M.A., 4-30 p.m.

June 7th—Annual General Meeting, R.C.V.S., 12 noon, at 10 Red Lion Square, to be followed by Annual General Meeting of the Victoria Veterinary Benevolent Fund. Formal opening of R.C.V.S. Library by the Rt. Hon. Col. L. S. Amery, Secretary of State for the Colonies, 3 p.m.

June 8th—Meeting of the Central Division at 10 Red Lion Square, W.C.1.

July 4th—R.C.V.S. Annual Dinner, Hotel Victoria, W.C.2.

N.V.M.A. Membership and the Receipt of the "Record."

In view of the approach of the time when the despatch of the *Veterinary Record* will be discontinued to members of the N.V.M.A. who have not paid their current membership subscription, the Finance Committee of the Association desires to draw the attention of members to the following portion of Article 30 of the Articles of Association :—

> "*If the subscription of a member shall be in arrear for three months he shall cease to be entitled to receive the several publications of the Association.*"

The Committee wishes to emphasise the fact that the £2 2s. 0d. annual subscription to the N.V.M.A., due on January 1st, is paid solely in respect of membership and not for the receipt of the *Record*, which is supplied free to members purely as one of the privileges of membership.

Royal College of Veterinary Surgeons.

Readers are reminded that on the afternoon of Thursday, June 7th, after the Annual General Meeting called for 12 noon, The Secretary of State for Dominion Affairs will attend at 10 Red Lion Square, to open the newly-furnished Library. The ceremony will take place at 3 p.m., and light refreshments will be provided at 4 p.m. All members of the College are cordially invited to attend, and as far as possible seats will be reserved for those who apply to the Secretary before Monday, the 4th instant.

Royal Army Veterinary Corps Golfing Society.

The annual meeting of the Society was held on the Course of the North Hants. Golf Club, Fleet, on the 9th and 10th of May, 1928.

PROGRAMME OF EVENTS AND LEADING SCORES.

First Day. Morning.

(a) Eighteen holes, Medal play, scratch, for R.A.V.C. Challenge Cup.

(b) Eighteen holes, Medal play, under Handicap, for R.A.V.C. Founder's Cup.

These two events were carried out concurrently.

	Handicap.	*Gross.*	*Nett.*
Major Bone	8	85	77
Colonel Todd	16	96	80
Colonel Stratton	18	101	83
Colonel A. Smith	12	100	88

First Day. Afternoon.

Eighteen holes, foursomes, Medal play, under Handicap.

	Handicap.	*Nett Score.*
Major Holness	18	86
Major Roche-Kelly ...	18	
Colonel Smith	12	90
Colonel Hunt	7	
Colonel Olver	18	95
Major Bone	8	
Colonel Todd	16	98
Colonel Stratton	18	

Second Day. Morning.

Eighteen holes, Singles play, under Handicap V Bogey, for a Cup presented by the Captain of the Society (Major G. T. T. Jackson).

	Handicap.	*Result.*
Major Danels	18	3 down.
Major Roche-Kelly	18	4 „
Colonel Stratton	18	5 „

Second Day. Afternoon.

Eighteen holes, foursomes play, under Handicap V Bogey (Sweepstake).

Major Bone Lieut. Porter	4 down.
Colonel Todd Major Howe	7 down.

The following attended the meeting:—Colonel A. G. Todd, Colonel A. Olver, Colonel A. Smith, Lieut.-Colonel F. D. Hunt, Lieut.-Colonel F. T. Stratton, Lieut.-Colonel W. E. Schofield, Major and Mrs. O'Rorke, Major and Mrs. Turner, Major L. Danels, Major H. J. Holness, Major F. R. Roche-Kelly, Major and Mrs. Kirby, Major W. B. Howe, Lieut. C. U. K. Porter, Major E. Hearne, Major G. E. Tillyard, and Major H. Bone.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents

An Expression of Gratitude.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I should like to express my appreciation, through the medium of the *Record*, of the motion of sympathy and expressions of hope for my speedy recovery passed at the recent meeting of the Midland Division held at Coventry. I thank those present very heartily for their expressions of goodwill. I am pleased to state that I am now fully recovered and back in harness.—Yours faithfully,

T. SLIPPER.

The Elms,
Birmingham Road,
Sutton Coldfield.
24th May, 1928.

Cancer in Dogs.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In the report of the Meeting of the Central Division, which appears in the *Veterinary Record* of May 26th, I am interested in the statement by my friend Major Chambers, to the effect that "cancer in the dog is on the increase."

I express no opinion on the matter, because it is very difficult to eliminate the possible effect on figures of the following facts:—

(1) The number of dog licences issued in the year ending March 31st, 1920, was 1,808,685. The number issued in the year ending March 31st, 1927, was 2,865,367, an increase of well over one million.

(2) The average number of dogs registered annually at the Kennel Club before the War, was 18,000. In 1927 the number was nearly 60,000.

In view of the enormous increase in the number of dogs, both unregistered and registered, the increase in the interest taken by the public in dogs, and the fact that dog owners know of the importance which the veterinary profession now attaches to canine practice, it would be remarkable, irrespective of any other cause, if we did not see more cases of cancer in dogs now, than we did in the past.—Yours faithfully, S. J. MOTTON.

Penzance.
27th May, 1928.

Tuberculosis Order, 1925.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—On page 429 in your issue of May 26th, you give what purports to be a resolution of the West Riding Agricultural Committee, but what to my mind is an important qualification has been missed out in your quotation.

The resolution passed was the following: "That representation be made to the Ministry of Agriculture and Fisheries for an amendment of the Tuberculosis Order of 1925, so as to provide for the payment of compensation at not less than three-quarters of the market value in the case of animals slaughtered under the Order as the result of suffering from tuberculosis of the udder or giving tuberculous milk, *but which otherwise exhibit no definite clinical signs of tuberculosis which would bring them within the provisions of the Order.*

That a copy of this Resolution be forwarded to the Agricultural Committee of the County Councils' Association."

The Italics are mine and refer to the qualification not previously given.

Although the resolution was passed by the Agricultural Committee it has to be sanctioned by the County Council before any action can be taken.—Yours faithfully,

D. S. RABAGLIATI.

Veterinary Department,
County Hall,
Wakefield.
May 28th, 1928.

The Editor acknowledges the receipt of the following:—

Report of a meeting of the V.M.A. of Ireland, from Prof. J. J. O'Connor, Hon. Secretary.

Communications from Mr. H. W. Dawes, and Major A. N. M. Swanston.